

Block et al.

S/N: 10/605,943

In the Claims

1. (Currently Amended) An anode assembly comprising:
an anode disc;
a first x-ray source connected to the anode disc and configured to emit a first fan beam of x-rays;
a second x-ray source connected to the anode disc and configured to emit a second fan beam of x-rays; and
wherein the first x-ray source has a distance from a center of the anode disc different than that of the second x-ray source; and
wherein the first x-ray source and the second x-ray source are configured to extend radially about the anode disc.
2. (Original) The anode assembly of claim 1 wherein the anode disc is rotatable.
3. (Original) The anode assembly of claim 1 wherein the second fan beam has a spatial coverage equal to that of the first fan beam.
4. (Original) The anode assembly of claim 1 incorporated into a CT scanner.
5. (Original) The anode assembly of claim 4 wherein the first and the second x-ray sources are positioned relative to one another on the anode disc such that the first and the second x-ray sources may be treated as a single focal point for CT reconstruction.
6. (Original) The anode asscmbly of claim 4 wherein each x-ray source is configured to operate at an approximate 50% duty cycle per CT scan.
7. (Original) The anode assembly of claim 1 wherein each fan beam has a penumbra that extends along a z-axis.
8. (Original) The anode assembly of claim 1 wherein each x-ray source includes a tungsten target track integrally formed in a bevel region of the anode disc.
9. (Currently Amended) An x-ray tube assembly comprising:

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a plurality of independently controllable electron sources configured to emit electrons; and

an anode disc;

a plurality of target electrodes disposed on the anode disc and configured to receive electrons emitted by the plurality of independently controllable electron sources and emit a plurality of fan beams of radiographic energy in response thereto; and

wherein the plurality of independently controllable electron sources includes a first target electrode at a first radial distance from a center of the anode disc to produce a first spatial coverage and a second target electrode at a second radial distance from the center of the anode disc that is different than the first radial distance to produce a second spatial coverage that is substantially similar to the first spatial coverage.

10. (Original) The x-ray tube assembly of claim 9 wherein the plurality of target electrodes is oriented with respect to one another such that each fan beam has a similar spatial coverage.

11. (Original) The x-ray tube assembly of claim 10 wherein each fan beam extends along a z-axis.

12. (Currently Amended) The x-ray tube assembly of claim 9 wherein the plurality of electron sources includes a plurality of tungsten targets integrated in a beveled portion of a ~~rotatable~~^{the} anode disc.

13. (Original) The x-ray tube assembly of claim 9 wherein the plurality of target electrodes includes a pair of target electrodes and wherein each target electrode is configured to emit a respective fan beam of x-rays, each fan beam having a focal spot such that the respective focal spots are spaced apart from one another along a z-direction by approximately one millimeter.

14. (Original) The x-ray tube assembly of claim 13 wherein the respective focal spots are spatially separated from one another in an x-direction.

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15. (Original) The x-ray tube assembly of claim 9 wherein the plurality of electron sources includes a pair of cathode filaments and wherein the pair of cathode filaments is configured to alternately fire during an imaging scan.

16. (Original) The x-ray tube assembly of claim 9 incorporated into a CT imaging system.

17. (Original) The x-ray tube assembly of claim 16 wherein the CT imaging system includes a medical diagnostic imaging scanner.

18. (Currently Amended) A CT system comprising:
a rotatable gantry having a bore centrally disposed therein;
a table movable fore and aft through the bore and configured to position a subject for CT data acquisition;

a detector array disposed within the rotatable gantry and configured to detect high frequency electromagnetic energy attenuated by the subject;

an anode disc positioned within the rotatable gantry;

~~multiple high frequency electromagnetic energy projection sources positioned within the rotatable gantry extending circumferentially about the anode disc~~ and configured to project multiple high frequency electromagnetic energy fan beams toward the subject; and

wherein each projection source is configured to operate at a proportional duty cycle per scan.

19. (Original) The CT system of claim 18 wherein the multiple high frequency electromagnetic energy projection sources include a first source and a second source and wherein the first and the second source each operate at a 50% duty cycle per scan.

20. (Original) The CT system of claim 18 wherein the multiple high frequency electromagnetic energy projection sources are configured to project the multiple high frequency electromagnetic energy fan beams such each fan beam has a similar spatial coverage along a z-direction.

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21. (Original) The CT system of claim 18 wherein the high frequency electromagnetic energy projection sources include a plurality of anodes and a plurality of cathodes, and further comprising a controller configured to sequentially fire each cathode before re-firing a respective cathode.

22. (Original) The CT system of claim 21 wherein the number of anodes equals the number of cathodes.

23. (Original) The CT system of claim 18 further comprising a computer programmed to execute an image reconstruction process and wherein the multiple of high frequency electromagnetic energy projection sources are collectively considered a single high frequency electromagnetic energy projection source by the image reconstruction process.

24. (Original) The CT system of claim 18 configured to non-invasively acquire diagnostic data of a medical patient.